

**PREDACEOUS WATER BEETLES OF THE GENUS *DESMOPACHRIA*
BABINGTON: THE LEECHI-GLABRICULA GROUP
(COLEOPTERA: DYTISCIDAE)**

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The small, seed-like species of *Desmopachria* (s. str.) are often almost indistinguishable except by the male external genitalia. *D. glabricula* Sharp and the species related to it are separable from other groups by the strongly sclerotized aedeagus and the complex parameres. They differ from the type-species of *Desmopachria* (*nitida* Babington) in having the parameres compacted, not bifid, and from the *convexa-grana* Group in lacking free spurs on the parameres.

Hugh B. Leech, of the California Academy of Sciences, first recognized the complexity of the genitalia in the small species of *Desmopachria* more than 30 years ago. He kindly turned over to me his dissected specimens from Florida which clearly demonstrated that at least three species were then lumped under the name *Desmopachria grana* (LeConte). In the intervening decades, I have assembled material of these "tiny mites" as they were once called by David Sharp. In recent years, the widespread use of the black-light traps (UV traps) has greatly increased the available material. I am happy to name the following new species and to add its name to that of the group in honor of Hugh B. Leech in recognition of his many contributions to the study of the aquatic Coleoptera.

***Desmopachria leechi*, new species**

Diagnosis.—A small brownish *Desmopachria*, 1.3 to about 1.52 mm long by 0.8 to about 1.0 mm wide near the middle of the elytra. Smaller and less coarsely punctate both above and below than *D. convexa* (Aubé), but almost indistinguishable from *D. grana* (LeConte) except for the coarse setate punctation of the last visible abdominal sternite in both males and females. Male external genitalia diagnostic (Fig. 4).

Holotype male.—Total length 1.52 mm; greatest width near middle of elytra about 1.0 mm; width of pronotum at base 0.72 mm; width of pronotum at apex 0.56 mm; length of pronotum at midline about 0.35 mm. Ovate somewhat attenuate behind and moderately convex in lateral profile. Head moderately coarsely, irregularly punctate on vertex and clypeus; clypeus rounded in front, distinctly margined. Disk of pronotum about as coarsely punctate as vertex of head but with punctures denser along anterior margin

and at sides of base as usual; pronotal margins distinct; base of pronotum strongly recurved at outer (humeral) angles as in *grana*. Elytra about as coarsely punctate as pronotal disk but punctures more regularly distributed in irregular rows along suture and near base becoming more irregular, shallower, and sparser laterally and more irregularly distributed apically; no indication of a sutural stria; discal stria of coarser punctures not conspicuous. Venter punctate much as in *grana*; hind coxae more coarsely but more shallowly punctate than disk of pronotum; prosternal process much as in *grana*, similar in the sexes; most of venter inconspicuously punctate except for last visible abdominal sternite which is coarsely punctate at apex, along posterior margin, and in middle with light colored setae; middle of sternite feebly impressed. Color much as in *grana*; dorsum nearly uniformly yellowish brown, narrowly darker along bases of pronotum and elytral suture; thorax and head slightly lighter than elytra (feebly bicolorous); venter brownish yellow, darker along joints and sutures as usual.

Allotype female.—Very similar to male. Total length 1.52 mm; greatest width near middle of elytra 1.0 mm; width of pronotum at base 0.72 mm; width of pronotum at apex 0.56 mm; length of pronotum at midline about 0.32 mm. Last visible abdominal sternite with coarse punctures and light colored setae much as in male.

Holotype, allotype, and two male paratypes from: FLORIDA: *Alachua County*, Gainesville, 1–7 August 1956, BLT (UV trap), L. A. Hetrick (FSCA).

Other paratypes.—FLORIDA: *Alachua County*: Gainesville, BLT, 13–14 July 1978, F. N. Young (1 male UMMZ). Flatwoods east of Gainesville, 4 October 1937, F. N. Young (1 male UMMZ). Tiger Bay east of Gainesville, 19 September 1938, F. N. Young (4 males, 1 female). *Collier County*: Canal near Everglades, 15 August 1959, F. N. Young (1 male). *Dade County*: Timms Hammock near Homestead, 24 February 1919, H. S. Barber (1 male NMNH). Royal Palm State Park, 16 March 1924, W. S. Blatchley (1 male, PUC). Homestead, 15–16 August 1973, BLT, R. N. Baranowski (2 males, 3 females FSCA). Homestead, June 1929, P. J. Darlington, Jr. (1 male MCZ). Miami, 13 September 1960, BLT, P. E. Briggs (1 male FSCA). Royal Palm State Park, 20 July 1938, F. N. Young (1 male). Canal Southeast Florida City, 9 July 1962, F. N. Young (2 males, 1 female). *Franklin County*: Dog Island, 16 April 1947, F. N. Young (4 males, 2 females). *Glades County*: Near Harrisburg, 7 August 1972, F. N. Young (3 males, 6 females). *Hillsboro County*: Tampa, 23/4, C. V. Riley Collection (1 male NMNH). *Lee County*: Fort Myers, 18 March 1921, W. S. Blatchley (1 male PUC). *Liberty County*: Ditch 10 miles southeast Telogia, 7 May 1971, F. N. Young (1 male). *Monroe County*: Big Pine Key, pools in pinelands, 9 September 1941, F. N. Young (1 male, 2 females). Big Pine Key, 1–3 July 1978, BLT, L. Strang (10 males and females FSCA). Everglades National Park, 30 July

1969, BLT, C. A. Adamson (1 male, 1 female FSCA). *Sarasota County*: Sarasota, 5 March 1920, John G. Gehring Collection (13 males, 2 females MCZ). *Taylor County*: J. D. Sherman and Frederich Blanchard collections, (6 males MCZ). Ex J. D. Sherman Collection (7 males AMNH). *Volusia County*: Pool west of Daytona Beach, 10 August 1979, F. N. Young (1 male). *County?*: "Florida, Stephenville, J. D. Sherman Collection," (9 males NMNH).

GEORGIA: *Appling County*: Little Satilla R. north of Bristol, 28 August 1961, F. N. Young (1 male). *Lowndes County*: Valdosta, J. D. Sherman Collection, 1920 (1 male NMNH).

MISSISSIPPI: *Jackson County*: Ocean Springs, 24 June 1931, Henry Dietrich (1 male CU). Horn Island, 11 August 1944, light trap (1 male, 3 females CU).

SOUTH CAROLINA: *Kershaw County*: Camden, 18 June 1929, P. J. Darlington, Jr. (2 males, 2 females MCZ).

Desmopachria glabricula Sharp

Desmopachria glabricula Sharp, 1882. *Biologia Centrali-Americana*. Insecta. Coleoptera 1 (Part 2), p. 18. (Guatemala, Paso Antonio, 400', Champion).

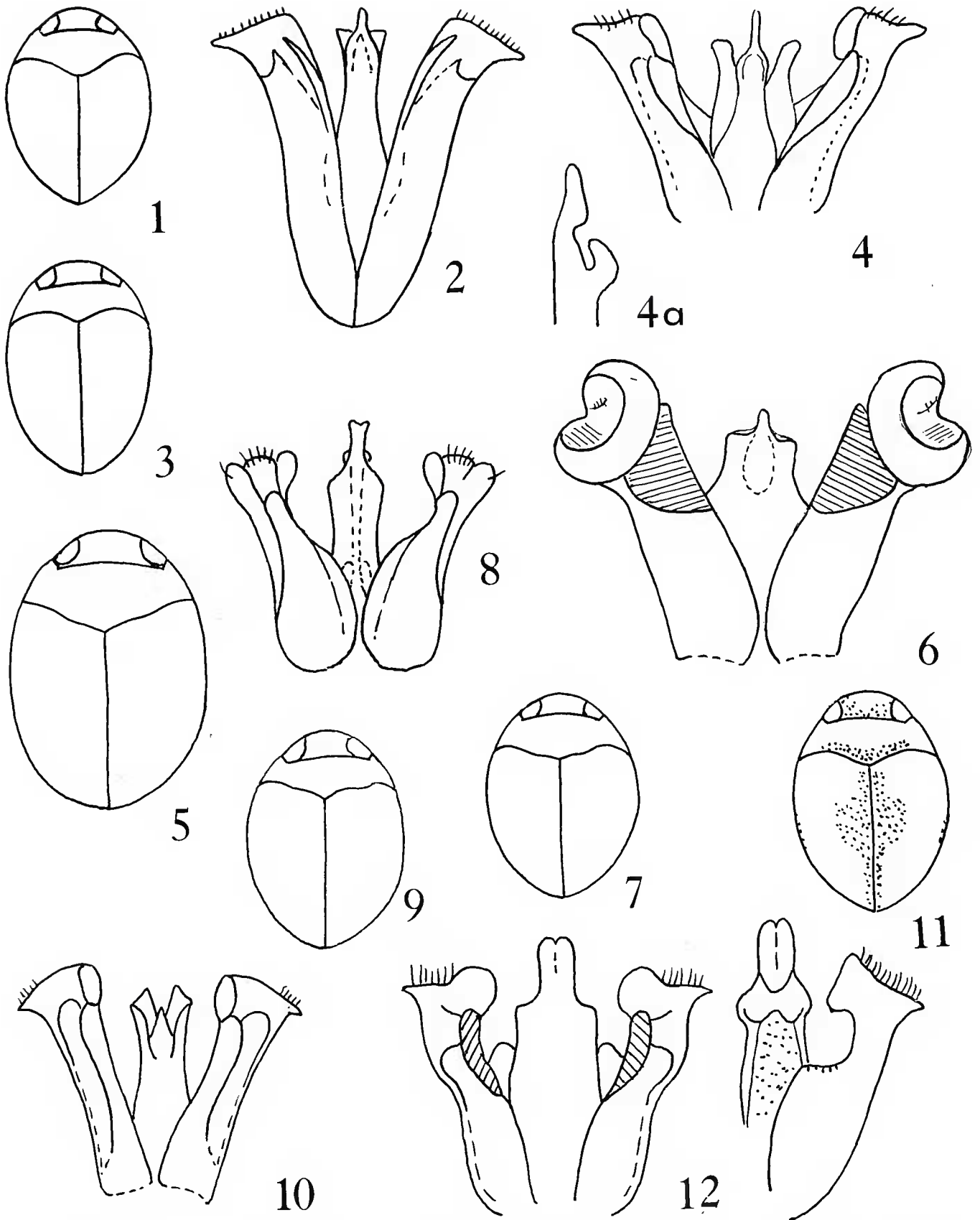
Diagnosis.—A small, brownish *Desmopachria* about 1.3 to 1.4 mm long by about 0.96 to 1.0 mm wide at about middle of elytra. Very similar to *grana* and *leechi*, but punctation finer and color probably darker when fully mature. Last visible abdominal sternite nearly smooth, transversely impressed similar to *grana*, not setate-punctate as in *leechi*. Male external genitalia diagnostic (Fig. 2).

Besides the syntypes, I have seen specimens from Costa Rica, British Honduras, and Panama. Sharp (1887, p. 752, supplement to op. cit.) added specimens from the Pearl Islands (Panama) to the original syntypes which are females. A male from the latter group of specimens has genitalia of the *nitida* type with divided parameres. The female cotypes match well with specimens from other Central American localities, but the Pearl Island specimens are more coarsely punctate—particularly along base and sides of pronotum and on the elytra.

I designate as Lectoholotype a female in the BMNH.

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Figs. 1–12. Dorsal Outlines and male external genitalia of species of *Desmopachria* of the *leechi-glabricula* Group. Fig. 1. *Desmopachria glabricula* Sharp, lectoholotype dorsal outline. Fig. 2. Same, external genitalia of a male from Costa Rica. Fig. 3. *Desmopachria leechi* n. sp., holotype dorsal outline. Fig. 4. Same, external genitalia of holotype. Fig. 4a. Same, lateral outline of aedeagus. Fig. 5. *Desmopachria strigata* n. sp., holotype dorsal outline. Fig. 6.



Same, external genitalia of holotype. Fig. 7. *Desmopachria flavida* n. sp., holotype dorsal outline. Fig. 8. Same, external genitalia of holotype. Fig. 9. *Desmopachria zimmermani* n. sp., holotype dorsal outline. Fig. 10. Same, external genitalia of holotype. Fig. 11. *Desmopachria volvata* n. sp., holotype dorsal outline with color pattern roughly indicated by stippling. Fig. 12. Same, external genitalia of male at left from above as in copulatory position; at right aedeagus and paramere viewed from below in copulatory position. All external male genitalia have been slightly spread apart before drying and, except for figure 12, are shown from above as in the copulatory position.

Desmopachria flavida, new species

Diagnosis.—A small, light yellowish brown species about 1.4 to 1.5 mm long. Greatest width near basal $\frac{1}{3}$ of elytra about 1.0 mm. Similar to *grana* but less regularly oval in dorsal outline and much less coarsely punctate both above and below. Male external genitalia diagnostic (Fig. 8).

Holotype male.—Total length 1.4 mm; greatest width near basal $\frac{1}{3}$ of elytra 1.0+ mm; width of pronotum at base 0.76 mm; width of pronotum at apex 0.52 mm; length of pronotum at midline 0.24 mm. Ovate, widest at basal $\frac{1}{3}$ of elytra, somewhat attenuate behind. Head very finely, sparsely punctate on front and clypeus; clypeus just detectably truncate in front; clypeal impressions shallow, inconspicuous. Pronotal disk punctate about as on head; coarser basal punctures very sparse except toward sides; anterior transverse row of coarser punctures almost obliterated at middle. Elytral punctation relatively fine, somewhat coarser than on disk of pronotum; discal stria of slightly larger punctures distinct but not conspicuous. Hind coxae finely, sparsely punctate, the punctures about as coarse as those of head; nearly smooth between punctures, shining. Last visible sternite almost smooth, transversely impressed across middle. Color light yellowish brown above and below, narrowly darker along elytral suture and bases and along some sutures and joints.

Allotype female.—Very similar to male in punctation and color. Total length 1.5 mm; greatest width near basal $\frac{1}{3}$ of elytra 1.0+ mm; width of pronotum at base 0.76 mm; width of pronotum at apex 0.52 mm; length of pronotum at midline about 0.30 mm.

Holotype and allotype from: MEXICO: *Nayarit*, Ixtlan del Rio, 22 September 1953, Borys Malkin (CAS). Paratypes: *Nayarit*, 25 miles S.W. Tepic, 23 November 1958, Hugh B. Leech (1 male FSCA). Cuernavaca (Flohr), ex cotypes of *D. circularis* Sharp, Biologia Centrali-Americana material (1 male, 2 females BMNH).

Desmopachria zimmermani, new species

Diagnosis.—A small reddish brown *Desmopachria* about 1.3 to 1.4 mm long by about 0.92 to 0.96 mm wide near middle of elytra. Body form short, subovate, somewhat attenuate behind. Punctation finer than in *grana*. Metasternum and hind coxae rather coarsely, but shallowly and sparsely punctate. Color generally yellowish brown or brownish yellow, the elytra slightly darker reddish brown and very much darker along suture and bases of pronotum. Hind coxae somewhat darker light reddish brown. Appendages light brownish yellow. Male external genitalia diagnostic (Fig. 10).

Holotype male.—Total length 1.36 mm; greatest width near middle of elytra 0.92 mm; width of pronotum at base 0.76 mm; width of pronotum at apex 0.48 mm; length of pronotum at midline 0.28 mm. Head finely, sparsely

punctate, somewhat more finely so than in *grana*; clypeus rounded anteriorly, distinctly margined. Pronotal disk about as finely, but more sparsely punctate than vertex of head; as usual, punctures along anterior margin and base coarser, but all punctures finer than in *grana*. Elytra with basal punctures coarser and more regularly seriate than those on pronotal disk but distinctly finer than in *grana*. Venter punctate much as in *grana*; last visible abdominal sternite appearing nearly smooth with only a few visible punctures, much as in *grana*. Color much as described above.

Allotype female.—Total length 1.4 mm; greatest width near middle of elytra 0.96 mm; width of pronotum at base 0.76 mm; width of pronotum at apex 0.56 mm; length of pronotum at midline about 0.24 mm. Very similar to male.

Holotype, allotype, and 9 paratypes from: MEXICO: *Sinaloa*, 8 miles east of Concordia, 8 April 1975, J. R. Zimmerman (NMSU). Paratype: MEXICO: J. R. Zimmerman, *Sinaloa*, San Blas, 26 July 1968. P. J. Spangler (1 male NMNH).

I take pleasure in naming this species for James R. Zimmerman of New Mexico State University.

***Desmopachria volvata*, new species**

Diagnosis.—A small *Desmopachria* about 1.3 to 1.5 mm long and about 0.9 to 0.96 mm wide near middle of elytra. Similar to *grana* in shape but more convex in lateral profile. Punctuation finer throughout. Last visible abdominal sternite nearly smooth, transversely impressed just before apex as in *grana*. Elytra and pronotal disk vaguely clouded with darker color, and outer coxal laminae and edges of epipleurae dark brown. Male external genitalia diagnostic (Fig. 12).

Holotype male.—Ovate, slightly attenuate behind; convex in lateral profile. Total length 1.36 mm; greatest width near middle of elytra 0.96 mm; width of pronotum at base 0.72 mm; width of pronotum at apex 0.5 mm; length of pronotum at midline about 0.28 mm. Head and clypeus finely, sparsely punctate; clypeus rounded in front, distinctly margined. Pronotal disk appearing almost impunctate with some coarser punctures along anterior margin and base as usual. Elytra finely and shallowly punctate—the punctures sparse and becoming smaller and sparser toward sides and apex; discal stria with some coarse punctures, but inconspicuous. Venter with metasternum and coxae very finely punctate but with some irregular microsculpture. Abdomen appearing almost impunctate; last visible abdominal sternite smooth, shining, transversely impressed just before apex. Head brownish yellow on clypeus and front, the base darker brown. Pronotum brownish yellow at sides with disk vaguely infuscated with reddish brown. Elytra with suture dark brown (piceous) and bases narrowly dark brown;

base and outer margins brownish yellow; disk with vague dark brown cloud. Venter with hind coxae dark brown, metasternum reddish yellow, and appendages, abdomen, epipleurae, and sides of elytra brownish yellow with inner edges of epipleurae very dark brown (piceous).

Allotype female.—Very similar to male. Total length 1.48 mm; greatest width near middle of elytra 0.72; width of pronotum at base about 0.96 mm; width of pronotum at apex 0.56; length of pronotum at midline about 0.32.

Holotype, allotype, and 2 paratypes from: PANAMA: Albrook Forest Site, BLT at 100 feet elevation, 9–10 May 1968, R. S. Hutton. Five other Paratypes from same locality but other dates (NMNH).

***Desmopachria strigata*, new species**

Diagnosis.—Larger, more convex, more coarsely punctate on elytra, and with different body shape from other members of group. Length about 1.6 to over 1.8 mm; greatest width near basal $\frac{1}{3}$ of elytra about 1.1 to 1.2 mm. Male external genitalia elaborate with a strigate area suggesting a stridulatory mechanism (Fig. 6).

Holotype male.—Ovate, not very attenuate behind. Total length 1.84 mm; greatest width near basal $\frac{1}{3}$ of elytra 1.2 mm; width of pronotum at base 0.96 mm; width of pronotum at apex 0.6 mm; length of pronotum at midline about 0.44 mm. Head moderately finely, sparsely punctate; clypeus somewhat more densely punctate than front, rounded in front, and distinctly margined. Pronotum punctate on disk about as coarsely as on front of head; less densely punctate than clypeus; more coarsely punctate across front margin and coarsely and irregularly punctate along base. Elytra more coarsely and closely punctate at bases and along suture than pronotum; punctures separated by less than their diameter near suture on bases and deeply impressed; irregular in shape but rarely confluent; shallower and sparser laterally and apically as usual. Metasternal wings and hind coxae coarsely, deeply, but sparsely punctate; punctures on coxae separated by more than their diameter. Abdomen almost smooth; last visible sternite transversely impressed across base and acutely so just before apex, the surface nearly smooth but with some coarser punctures and with some setate punctures at middle of penultimate visible sternite. Elytra reddish brown with head and pronotum uniformly light brownish yellow. Elytra deeper brown or piceous along suture and bases. Venter with hind coxae about same color as elytra; most of rest of venter, appendages, epipleurae, and sides of elytra light yellowish brown.

Allotype female.—Similar to male. Total length 1.76 mm; greatest width near basal $\frac{1}{3}$ of elytra 1.2 mm; width of pronotum at base 0.96; width of pronotum at apex 0.72 mm; length of pronotum at midline 0.4 mm.

Holotype, allotype, and 17 paratypes from: BRAZIL: Mato Grosso, Corumba, presumably collected at light, collection of A. Zimmermann (ZSBS).

The holotype male of this series may be slightly abnormal in shape, but all the males have similar genitalia, and both males and females approximate in varying degrees the dorsal outline.

Abbreviations

Abbreviations used in this manuscript are as follows: FSCA, Florida State Collection of Arthropods, Gainesville, FL; UMMZ, University of Michigan Museum of Zoology, Ann Arbor, MI; NMNH, U.S. National Museum of Natural History, Washington, DC; PUC, Purdue University Collection, W. Lafayette, IN; MCZ, Museum of Comparative Zoology, Cambridge, MA; AMNH, American Museum of Natural History, New York, NY; CU, Cornell University Collection, Ithaca, NY; NMSU, New Mexico State University Collection, Los Alamos, NM; ZSBS, Zoologische Sammlung des Bayerischen Staats, München, Germany; BMNH, British Museum (Natural History), London, United Kingdom.

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